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FOREST INSECT CONDITIONS

IN THE PACIFIC NORTHWEST

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INSECT AND DISEASE CONTROL BRANCH
DIVISION OF TIMBER MANAGEMENT
PACIFIC NORTHWEST REGION
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

MARCH 1968

This is the 20th annual report
of forest insect conditions in Oregon
and Washington based on cooperative surveys
sponsored by the Northwest Forest Pest Action Council.
The combined efforts of many organizations and individuals
made these surveys possible. Special acknowledgement
is made to the principal cooperators: Oregon
State Board of Forestry and Washington
Department of Natural Resources.

COVER BACKGROUND: Egg and larval galleries of *Orthotomicus ornatus* Sw. on the bark of ponderosa pine.

FOREST INSECT CONDITIONS IN THE PACIFIC NORTHWEST

DURING 1967

BY

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AND

L. F. PETTINGER

FEBRUARY 1968

INSECT AND DISEASE CONTROL BRANCH
DIVISION OF TIMBER MANAGEMENT
PACIFIC NORTHWEST REGION
U. S. FOREST SERVICE

Page

SURVEY FINDINGS IN BRIEF..... 1

INTRODUCTION..... 4

MAJOR DEFOLIATOR PROBLEMS..... 4

Larch casebearer..... 4
Figure 1. Distribution of larch casebearer in northeast Washington..... 5
Larch sawfly..... 7
Larch bud moth..... 8
European pine shoot moth..... 9
Needle miner..... 10
Western hemlock looper..... 11

MAJOR SUCKING INSECT PROBLEMS..... 12

Balsam woolly aphid..... 12
Mites..... 15

MAJOR BARK BEETLE PROBLEMS..... 16

Mountain pine beetle..... 16
Douglas-fir beetle..... 25
Oregon pine ips..... 30
Western pine beetle..... 33
Fir engraver..... 36
Silver fir beetles..... 39
Engelmann spruce beetle..... 40

CONE AND SEED INSECTS..... 43

OTHER FOREST PEST PROBLEMS..... 45

A tent caterpillar..... 45
Hemlock sawfly..... 45
Sawflies..... 45
Black-headed budworm..... 45
Douglas-fir tussock moth..... 46
Spruce budworm..... 46
Spruce aphid..... 46
Green-striped forest looper..... 46
Cypress tip moth..... 46
Alder flea beetle..... 48
Douglas-fir engraver..... 49
Dying hemlock..... 50
Tree damage by bears..... 51

Page

APPENDIX..... 54

Aerial surveys..... 54
Table 40.--Summary of cooperative aerial survey activities in 1967..... 54
Table 41.--Extent of infestations in Oregon in 1967, by reporting area, insect species, and intensity of infestation..... 55
Table 42.--Extent of infestations in Washington in 1967, by reporting area, insect species, and intensity of infestation..... 65
Figure 2. Forest insect reporting areas Oregon and Washington..... back cover

SURVEY FINDINGS IN BRIEF

Forest insect outbreaks were reported on 1,910,900 acres in Oregon and Washington in 1967 (table 1). Defoliators accounted for 55 percent of this damage, bark beetles contributed 36 percent, and 9 percent was attributed to sucking insects. During the last decade, the trend of infestations was as follows.

Year	Infested acreage	Year	Infested acreage
1958	2,032,720	1963	1,311,085
1959	1,448,360	1964	1,116,130
1960	1,272,960	1965	1,402,610
1961	1,223,230	1966	1,220,712
1962	1,305,170	1967	1,910,900

The extent and intensity of outbreaks by insect species occurring in Oregon are given in table 41 and in Washington in table 42. The major problem areas of insect outbreaks are shown in the generalized map in figure 2.

Both States are divided into forest insect reporting areas as shown on the inside of back cover. These insect reporting areas are a simple convenience for reporting conditions in a geographical area. No attempt has been made to summarize insect outbreaks according to land ownership within an individual reporting area.

The main findings of aerial and ground surveys in 1967 were:

1. Mountain pine beetle.--Outbreaks in western white pine stands increased in both Oregon and Washington. Outbreaks on ponderosa pine were static in Washington and decreased in Oregon, but the potential for catastrophic outbreaks still remains. Tree killing in lodgepole pine stands increased greatly. Outbreaks on sugar pine remained at a low level.

2. Douglas-fir beetle.--The destructive outbreaks increased in Washington. Losses decreased in eastern Oregon, and remained static in western Oregon.

3. Western pine beetle.--Losses were higher in Oregon and lower in Washington. Subepidemic tree killing increased in many ponderosa pine stands, indicating a possible beetle population build-up.

4. Fir engraver.--Tree killing increased in Oregon and Washington.

5. Oregon pine ips.--The size and intensity of the infestations increased. Epidemic damage was sustained in many ponderosa pine sapling stands.

6. Engelmann spruce beetle.--Losses were generally downward, with some localized damage increasing.

7. Silver fir beetles.--Losses decreased in Pacific silver fir stands of Washington. No epidemic losses were reported in Oregon.

8. Larch casebearer.--Infestations of this introduced insect continued to spread in the western larch stands of eastern Washington. Parasites were released for the second year.

9. Larch sawfly.--Outbreaks decreased in Oregon and increased in Washington.

10. Larch bud moth.--Widespread epidemic outbreaks occurred in northeastern Washington.

11. Pine needle miner.--Outbreaks decreased in the ponderosa and lodgepole pine stands of central Oregon.

12. Western hemlock looper.--A comparatively small area of very heavy defoliation occurred on the Mt. Baker National Forest in Washington.

13. European pine shoot moth.--The infestation continued to spread within the Containment Zone in western Washington. Numerous infested pines were detected in several communities in southeastern Washington and northeastern Oregon. All infested pines found in Portland, Oregon, were fumigated or destroyed to eradicate the insect.

14. Black-headed budworm.--Subepidemic populations exist at several locations in both States.

15. Balsam woolly aphid.--Damage increased in both States. Infestations were found further south in the southern Coast Range of Oregon.

Table 1.--Summary of 1967 forest insect epidemic infestations in Oregon and Washington

Insects [1/]	Oregon		Washington		Regional total	
	Infestation centers	Area	Infestation centers	Area	Infestation centers	Area
	Number	Acres	Number	Acres	Number	Acres
Defoliators:						
Sawflies on true firs	3	4,400	0	0	3	4,400
Sawflies on larch	2	680	16	15,660	18	16,340
Sawflies on knobcone pine	15	6,020	0	0	15	6,020
Sawflies on western hemlock	1	500	0	0	1	500
Larch bud moth	0	0	76	139,060	76	139,060
Western hemlock looper	0	0	1	1,600	1	1,600
Needle miners (L)	34	80,460	0	0	34	80,460
Needle miners (P)	5	4,800	0	0	5	4,800
Larch casebearer	0	0	121	783,650	121	783,650
Forest tent caterpillar on red alder	8	10,990	0	0	8	10,990
All defoliators	68	107,850	214	939,970	282	1,047,820
Sucking insects:						
Balsam woolly aphid	466	116,080	97	41,470	563	157,550
Spider mites	12	13,200	0	0	12	13,200
All sucking insects	478	129,280	97	41,470	575	170,750
Bark beetles:						
Douglas-fir beetle (Westside)	643	47,710	69	15,960	712	63,670
Douglas-fir beetle (Eastside)	61	2,480	247	37,450	308	39,930
Douglas-fir engraver	3	220	0	0	3	220
Engelmann spruce beetle	22	3,170	24	4,650	46	7,820
Fir engraver	298	25,470	46	3,580	344	29,050
Mountain pine beetle (L)	354	186,690	8	2,530	362	189,220
Mountain pine beetle (S)	13	1,000	0	0	13	1,000
Mountain pine beetle (W)	428	90,040	240	74,280	668	164,320
Mountain pine beetle (P)	275	43,090	102	18,290	377	61,380
Oregon pine ips	633	55,170	11	900	644	56,070
Western pine beetle	418	65,870	26	6,730	444	72,600
Silver fir beetles	0	0	30	7,050	30	7,050
All bark beetles	3,148	520,910	803	171,420	3,951	692,330
All insects	3,694	758,040	1,114	1,152,860	4,808	1,910,900

1/ Mountain pine beetle and needle miner infestations are separated by tree species: L, lodgepole pine; S, sugar pine; W, western white pine; P, ponderosa pine.

INTRODUCTION

Epidemic outbreaks of forest insects were detected and mapped according to intensity of damage from the air. Ground surveys were made to verify the aerial survey findings, detect sub-epidemic insect populations, and evaluate threat and insect population trends.

The problems of bear damage to forest trees and dying hemlock were recorded and discussed at the request of the Northwest Forest Pest Action Council.

MAJOR DEFOLIATOR PROBLEMS

Standards used in the aerial detection survey for evaluation of forest defoliator outbreaks are as follows:

Defoliation intensity	Appearance of damage
Light	Barely visible from air
Moderate	Top 1/4 of tree defoliated
Heavy	Top 1/2 of tree defoliated
Very heavy	Top 3/4 of tree defoliated

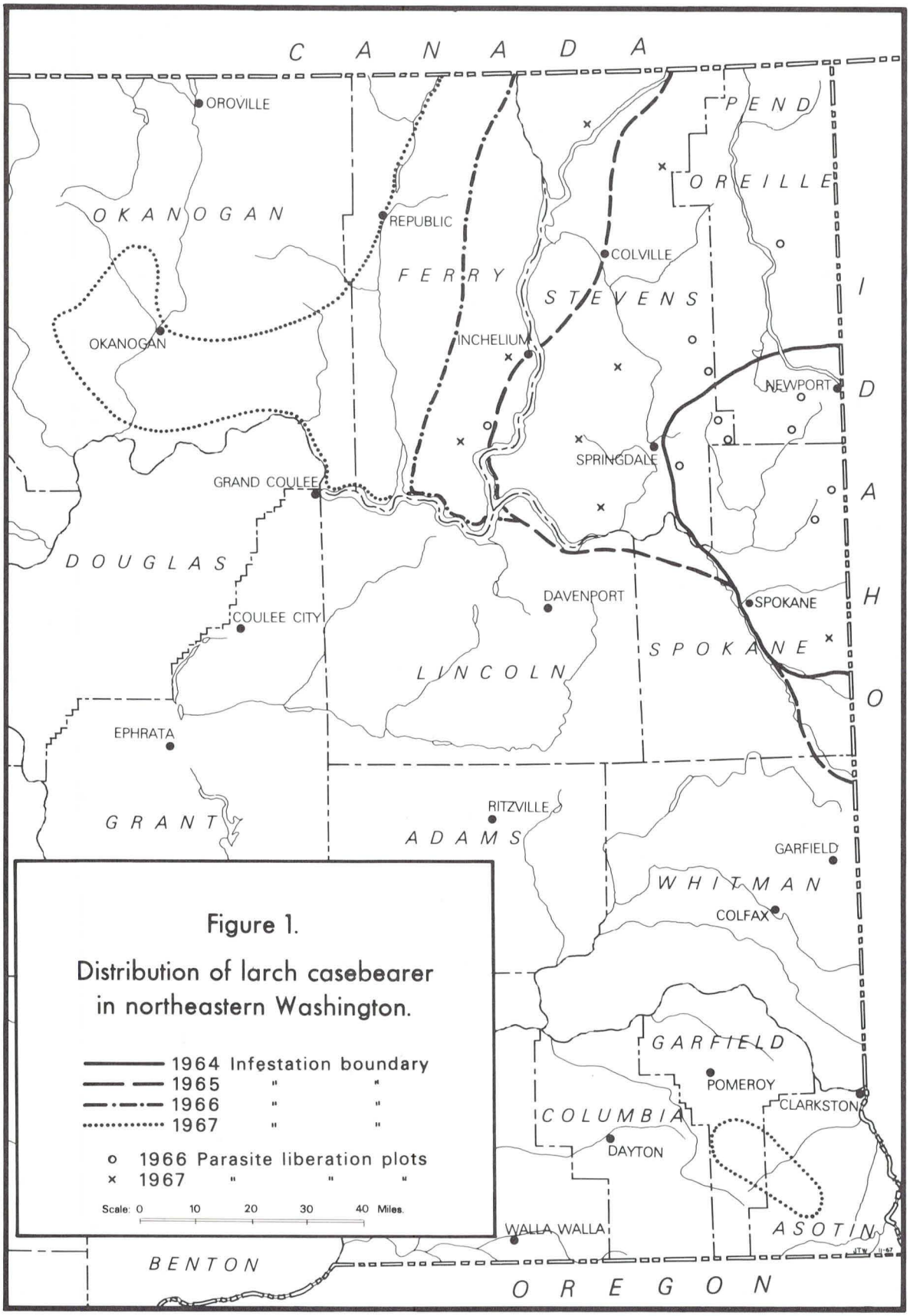
LARCH CASEBEARER, *Coleophora laricella* (Hübner)

Host: Western larch.

Damage: Infestations continued to spread in northeast Washington where light to extremely heavy populations of the moth can now be found in over 8,000 square miles of larch forests. This year the insect was found west of the Okanogan River at Loup Loup Summit on the Okanogan National Forest and was found for the first time in southeast Washington in Garfield and Asotin Counties (figure 1).

Over 783,000 acres of visible damage was mapped by aerial survey contrasted to approximately 470,000 acres in 1966 (table 2). Defoliation varies from light to extreme. Tree growth has been reduced in older infestation centers, but as yet no tree mortality has occurred.

The majority of the damage recorded occurred on the Colville and Kaniksu National Forests and the Northeast Washington District (table 3).


C A N A D A
OROVILLE
OKANOGAN
REPUBLIC
FERRY
STEVENS
PEND OREILLE
COLVILLE
OKANOGAN
INCHELIUM
NEWPORT
SPRINGDALE
GRAND COULEE
DOUGLAS
DAVENPORT
SPOKANE
COULEE CITY
LINCOLN
SPOKANE
EPHRATA
GRANT
RITZVILLE
ADAMS
GARFIELD
WHITMAN
COLFAX
GARFIELD
POMEROY
CLARKSTON
COLUMBIA
DAYTON
WALLA WALLA
ASOTIN
BENTON
O R E G O N
I D A H O
Figure 1.
Distribution of larch casebearer in northeastern Washington.
1964 Infestation boundary
1965 " "
1966 " "
1967 " "
1966 Parasite liberation plots
1967 " " "
Scale: 0 10 20 30 40 Miles.

Trend: The insect is expected to continue its spread throughout the larch stands of eastern Washington and can be expected to move into northeastern Oregon within the next few years. Parasite liberations are not expected to cause any reduction in defoliation for 5 to 10 years.

Control: Parasites were liberated at 11 localities in 1966 and 8 locations in 1967. More liberations are planned for 1968.

Table 2.--Trend of larch casebearer infestations in Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Colville N.F.	0	200	17,180	63,840	193,500
Kaniksu N.F.	6,270	30,180	167,480	244,140	350,560
Colville I.R.	0	0	1,120	2,600	13,760
Spokane I.R.	0	0	3,440	22,600	43,100
Northeast Washington District	30,760	82,530	151,160	137,500	182,730
All areas	37,030	112,910	340,380	470,680	783,650

1/ N.F., National Forest; I.R., Indian Reservation

Table 3.--Extent of larch casebearer infestations in Washington in 1967 by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Washington:						
Colville I.R.	13	3,520	3,040	1,600	5,600	13,760
Colville N.F.	40	109,730	27,420	19,120	37,230	193,500
Kaniksu N.F.	23	51,800	132,580	90,630	75,550	350,560
Northeast Washington District	37	87,920	41,710	20,820	32,280	182,730
Spokane I.R.	8	14,360	5,160	7,580	16,000	43,100
Washington areas	121	267,330	209,910	139,750	166,660	783,650
Regional total	121	267,330	209,910	139,750	166,660	783,650

1/ I.R., Indian Reservation; N.F., National Forest

LARCH SAWFLY, *Pristiphora erichsonii* (Htg.)

Host: Western larch.

Damage: Infestations of the larch sawfly continued in Oregon and Washington. Damage increased in northeast Washington with most of the losses located on the Okanogan and Colville National Forests (table 4).

In Oregon the infestation on the Warm Springs Indian Reservation subsided, but new and smaller infestations developed on the Mt. Hood National Forest.

Trend: Upward in Washington and static in Oregon. Tree mortality has not occurred from the defoliation, nor is any expected in the immediate future.

Control: Control is not needed in 1968. Parasites and predators usually reduce most sawfly populations within a year or two.

Table 4.--Extent of larch sawfly infestations in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Oregon:						
Mt. Hood N.F.	2	0	200	480	0	680
Oregon areas	2	0	200	480	0	680
Washington:						
Colville N.F.	7	3,400	9,560	220	0	13,180
Kaniksu N.F.	3	360	760	120	0	1,240
Okanogan N.F.	6	960	280	0	0	1,240
Washington areas	16	4,720	10,600	340	0	15,660
Regional total	18	4,720	10,800	820	0	16,340

1/ I.R., Indian Reservation; N.F., National Forest

LARCH BUD MOTH, *Zieraphera griseana* (Hbn.)

Host: Western larch.

Damage: This moth caused widespread defoliation in north central Washington where light to heavy damage occurred at several localities. All damage was located on the Colville and Okanogan National Forests and the Colville Indian Reservation (table 5).

Trend: Undetermined, probably downward.

Control: Control will not be needed in 1968. The outbreak is expected to be short lived.

Table 5.--Extent of larch budmoth infestations in Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Washington:						
Okanogan N.F.	11	7,400	6,320	960	560	15,240
Colville N.F.	56	80,800	10,560	8,080	2,940	102,380
Colville I.R.	9	4,880	12,280	4,280	0	21,440
Washington areas	76	93,080	29,160	13,320	3,500	139,060
Regional total	76	93,080	29,160	13,320	3,500	139,060

1/ N.F., National Forest; I.R., Indian Reservation

EUROPEAN PINE SHOOT MOTH, *Rhyacionia buoliana* (Schiff.)

Hosts: Mugho, lodgepole, and Scotch pines are preferred hosts, but all species of pines are subject to attack.

Damage: Ornamental pines in 83 communities and growing stock in 44 Christmas tree plantations were surveyed outside the Containment Zone in Washington. Infested trees were found in Longview, Tenino, College Place, Prosser, Kennewick, and Walla Walla. The moth continued to spread and tree damage intensified in the Containment Zone.

In Oregon infested trees were found west of the Cascade Mountains at two locations in Portland. Well-established infestations were detected at Hermiston, Umatilla, and at McNary Dam east of the Cascade Mountains in Oregon. All infested trees in the Portland metropolitan area were fumigated or destroyed before moth flight. All other infestations outside the Containment Zone are being evaluated before control action is recommended.

Trend: Continued spread of the infestation through movement of infested stock can be expected.

Control: We have procedures and schedules for fumigating pine in bundles, as container stock, or as liners in place. This fumigating, together with strict enforcement of existing quarantines, will slow the spread of the moth.

NEEDLE MINER, *Coleotechnites* near *milleri*

Hosts: Lodgepole and ponderosa pines.

Damage: Continued attacks occurred on lodgepole and ponderosa pine in the upper Deschutes Basin on the Deschutes and Winema National Forests (tables 6 and 7). Infestations increased in intensity and caused some tree mortality in the older infestations.

Trend: Moderate to heavy defoliation and increased tree killing is expected next year.

Control: No control is needed in 1968.

Table 6.--Extent of needle miner infestations on lodgepole pine in Oregon in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Deschutes N.F.	20	37,560	6,080	2,640	0	46,280
Winema N.F.	14	7,060	4,600	7,640	14,880	34,180
Oregon areas	34	44,620	10,680	10,280	14,880	80,460
Regional total	34	44,620	10,680	10,280	14,880	80,460

1/ N.F., National Forest

Table 7.--Extent of needle miner infestations on ponderosa pine in Oregon in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Winema N.F.	5	4,800	0	0	0	4,800
Oregon areas	5	4,800	0	0	0	4,800
Regional total	5	4,800	0	0	0	4,800

1/ N.F., National Forest

WESTERN HEMLOCK LOOPER, *Lambdina fiscellaria lugubrosa* Hulst

Host: Western hemlock

Damage: Very heavy defoliation occurred on 1,600 acres in the Bacon Creek drainage on the Mt. Baker National Forest in Washington. Fall egg surveys indicate the infestation is spreading in Bacon Creek and building up at several widely scattered locations on the Forest. Defoliation is expected next year in the Cascade River, Finney Creek, and Whitehorse Mountain area. Tree mortality is expected in the heavily defoliated area in Bacon Creek. Larval collections from ground detection plots along the coastal region of Oregon and Washington showed no significant population buildups.

Trend: Upward.

Control: Plans call for field testing promising insecticides to find a substitute for DDT, should control of a large looper infestation become necessary.

MAJOR SUCKING INSECT PROBLEMS

BALSAM WOOLLY APHID, *Adelges piceae* (Ratz.)

Hosts: Pacific silver fir, subalpine fir, and grand fir.

Damage: The infested acreage nearly tripled that reported in 1966 (table 8). The majority of the damage occurred in the Cascades with lesser amounts in the Coast Range. Seventy-four percent of the Regional losses were reported in Oregon with most of the damage located on the Mt. Hood, Umpqua, and Willamette National Forests.

In Washington, most of the losses occurred on the Gifford Pinchot and Snoqualmie National Forests (table 9).

Trend: A slight increase is expected next year in the Cascade Mountains of both States.

Control: No practical control method is available for use under forest conditions in commercial stands. Logging of infested, merchantable trees and those of declining thrift is the only means of combating this pest.

Limited field tests of promising insecticides are being made against the aphid on recreational sites in the vicinity of Mt. St. Helens. Several subalpine fir were sprayed with a back-pack mist blower using Baygon, a carbamate insecticide. Additional tests are planned for 1968.

Table 8.--Trend of balsam woolly aphid infestations in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	19,640	17,320	5,260	2,370	5,790
Mt. Hood N.F.	9,870	17,660	7,530	6,460	26,400
Rogue River N.F.	6,600	18,760	4,140	4,850	8,520
Siskiyou N.F.	0	0	0	840	4,660
Siuslaw N.F.	4,030	340	0	120	0
Umpqua N.F.	11,830	17,960	4,320	3,580	15,980
Willamette N.F.	44,710	72,760	19,430	16,780	49,650
Winema N.F.	410	0	0	0	0
Warm Springs I.R.	3,380	1,380	1,750	420	960
Crater Lake N.P.	1,680	1,320	3,350	1,840	4,120
Coos-Douglas Dist.	0	520	640	5,060	0
Northwest Oregon District	0	20	0	0	0
Oregon areas	102,150	148,040	46,420	42,320	116,080
Washington:					
Gifford Pinchot N.F.	63,930	25,860	11,040	8,360	26,720
Snoqualmie N.F.	10,560	5,800	7,800	1,680	10,520
Wenatchee N.F.	600	720	240	0	0
Yakima I.R.	6,960	840	400	320	230
Southwest Washington Dist.	0	1,040	980	0	1,790
Mt. Rainier N.P.	3,260	1,120	360	800	2,210
Washington areas	85,310	35,380	20,820	11,160	41,470
Regional total	187,460	183,420	67,240	53,480	157,550

1/ N.F., National Forest; I.R., Indian Reservation; N.P., National Park

Table 9.--Extent of balsam woolly aphid infestations in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Oregon:						
Deschutes N.F.	58	4,890	720	180	0	5,790
Mt. Hood N.F.	90	22,740	3,380	280	0	26,400
Rogue River N.F.	21	7,520	1,000	0	0	8,520
Siskiyou N.F.	25	2,990	1,670	0	0	4,660
Umpqua N.F.	60	13,950	1,330	300	400	15,980
Willamette N.F.	196	38,190	8,770	1,970	720	49,650
Warm Springs I.R.	6	900	60	0	0	960
Crater Lake N.P.	10	3,920	200	0	0	4,120
Oregon areas	466	95,100	17,130	2,730	1,120	116,080
Washington:						
Gifford Pinchot National Forest	49	24,000	1,800	920	0	26,720
Snoqualmie N.F.	33	7,320	2,200	520	480	10,520
Yakima I.R.	1	0	230	0	0	230
Southwest Wash. District	4	1,230	560	0	0	1,790
Mt. Rainier N.P.	10	1,350	380	480	0	2,210
Washington areas	97	33,900	5,170	1,920	480	41,470
Regional total	563	129,000	22,300	4,650	1,600	157,550

1/ N.F., National Forest; I.R., Indian Reservation; N.P., National Park

MITES

Hosts: True firs and Douglas-fir.

Damage: The spider mite infestations reported last year on the Malheur National Forest, Oregon have declined considerably. Very light defoliation occurred on 350 acres of Douglas-fir and true fir.

A larger spider mite infestation was detected near Hebo Mountain on the Siuslaw National Forest in Oregon. Moderate to heavy defoliation of the current year's foliage occurred on 12,850 acres of a 56-year-old Douglas-fir plantation.

A small outbreak of an eriophyid mite, *Trisetacus pseudotsugae* K., occurred on the Tillamook Forest of the Northwest Oregon State District. This mite caused light damage to the tops of young Douglas-fir. Similar damage was observed on western hemlock and true firs.

Trend: Unknown, probably downward.

Control: Direct control is not needed as insect predators usually keep mite populations in check.

MAJOR BARK BEETLE PROBLEMS

MOUNTAIN PINE BEETLE, *Dendroctonus ponderosae* Hopk.

Mountain pine beetle damage accounted for 60 percent of the losses attributed to bark beetles. About 85 percent of the mountain pine beetle losses occurred in lodgepole pine and western white pine stands. The remaining losses were located in young ponderosa pine and in old-growth sugar pine stands. The damage is discussed below by major host.

Host: Lodgepole pine.

Damage: Losses nearly doubled the total reported in 1966 (table 10). Region-wide, 99 percent of the tree killing occurred in Oregon with 89 percent of the losses located on the Deschutes, Fremont, and Winema National Forests. Significant tree killing was found on the Colville, Okanogan, and Wenatchee National Forests in Washington (table 11).

Trend: Tree killing is expected to remain high in the overmature stands in both States.

Control: Logging merchantable infested and intermingled green trees is recommended to reduce beetle populations and salvage timber values.

Host: Western white pine.

Damage: Fifty-five percent of the losses occurred in Oregon (table 12). Tree killing on the Willamette National Forest accounted for 78 percent of the losses detected in Oregon. Significant losses were also reported on the Mt. Hood and Umpqua National Forests.

Tree killing in Washington remained static. Most of the losses, 62 percent of the State total, occurred on the Quinault Indian Reservation and the Wenatchee and Snoqualmie National Forests (table 13).

Trend: The damage is expected to remain static in Washington due to the depletion of susceptible host; however, mortality in Oregon will continue at its present high rate.

Control: Logging merchantable infested and intermingled green trees is recommended to reduce beetle populations and salvage timber values. Direct control is impractical in western white pine due to the prevalence of blister rust.

Host: Ponderosa pine.

Damage: Region-wide, the infested acreage had increased (table 14). Seventy percent of the losses occurred in Oregon with over 50 percent of the mortality located on the Wallowa-Whitman National Forest. In Washington, most of the losses were found on the Okanogan National Forest (table 15).

Results of a recent survey on the Wallowa-Whitman National Forest in a 10-year-old mountain pine beetle infestation show growth has been set back for about 30 years. Stocking, basal area, and the average tree diameter in the stand has been greatly reduced.

Trend: Ponderosa pine losses are expected to remain high in local areas in both States.

Control: Thinning of dense, overstocked stands before the beetles attack is encouraged. Direct control is used in pole-size stands only as a "stop-gap" measure to reduce the beetle population.

Host: Sugar pine.

Damage: The number of infested acres in Oregon decreased from the high recorded in 1963 (table 16). Most of the tree killing occurred on the Rogue River and Umpqua National Forests (table 17).

Trend: Losses are expected to be less in 1968.

Control: Logging merchantable infested and intermingled green trees is recommended to reduce populations and salvage timber values.

Table 10.--Trend of mountain pine beetle infestations in lodgepole pine in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	10,330	9,100	11,930	10,480	14,850
Fremont N.F.	13,390	21,950	47,100	38,380	109,690
Malheur N.F.	610	2,060	8,410	4,540	5,870
Ochoco N.F.	0	0	40	0	0
Rogue River N.F.	360	1,100	0	180	0
Siskiyou N.F.	0	190	80	30	0
Umatilla N.F.	2,020	530	140	670	2,910
Umpqua N.F.	2,190	160	0	200	70
Wallowa-Whitman N.F.	2,640	1,440	3,130	4,230	9,620
Willamette N.F.	355	160	0	0	400
Winema N.F.	17,060	17,100	21,560	29,650	40,900
Warm Springs I.R.	85	0	0	0	180
Crater Lake N.P.	1,180	2,000	1,800	1,030	2,200
Oregon areas	50,220	55,790	94,190	89,390	186,690
Washington:					
Colville N.F.	4,360	3,540	0	0	640
Gifford Pinchot National Forest	8,960	880	0	0	0
Kaniksu N.F.	600	0	0	0	0
Okanogan N.F.	1,200	2,170	440	0	650
Olympic N.F.	680	0	80	0	0
Umatilla N.F.	190	0	50	0	0
Wenatchee N.F.	390	1,800	840	0	880
Colville I.R.	480	180	0	0	0
Yakima I.R.	760	200	560	80	360
Washington areas	17,620	8,770	1,970	80	2,530
Regional total	67,840	64,560	96,160	89,470	189,220

1/ N.F., National Forest; N.P., National Park; I.R., Indian Reservation

Table 11.--Extent of mountain pine beetle infestations on lodgepole pine in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Deschutes N.F.	86	6,870	2,600	4,440	940	14,850
Fremont N.F.	80	21,030	72,360	2,350	13,950	109,690
Malheur N.F.	25	1,770	2,740	1,360	0	5,870
Umatilla N.F.	21	700	1,250	960	0	2,910
Umpqua N.F.	1	70	0	0	0	70
Wallowa-Whitman National Forest	29	2,120	1,330	4,080	2,090	9,620
Willamette N.F.	8	230	170	0	0	400
Winema N.F.	99	19,430	14,580	6,570	320	40,900
Warm Springs I.R.	1	0	180	0	0	180
Crater Lake N.P.	4	990	800	0	410	2,200
Oregon areas	354	53,210	96,010	19,760	17,710	186,690
Washington:						
Okanogan N.F.	3	0	210	440	0	650
Wenatchee N.F.	3	800	80	0	0	880
Colville N.F.	1	0	0	0	640	640
Yakima I.R.	1	360	0	0	0	360
Washington areas	8	1,160	290	440	640	2,530
Regional total	362	54,370	96,300	20,200	18,350	189,220

1/ N.F., National Forest; N.P., National Park; I.R., Indian Reservation

Table 12.--Trend of mountain pine beetle infestations in western white pine in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	1,520	1,640	230	30	140
Fremont N.F.	0	0	0	100	0
Mt. Hood N.F.	39,770	36,820	27,810	7,720	7,510
Rogue River N.F.	0	190	920	480	720
Siskiyou N.F.	0	4,340	1,680	5,660	800
Umpqua N.F.	3,350	6,070	2,920	21,130	9,280
Willamette N.F.	22,500	43,440	38,240	34,750	70,340
Warm Springs I.R.	80	200	80	0	530
Winema N.F.	620	0	240	0	660
Coos-Douglas Dist.	0	0	0	80	0
Crater Lake N.P.	0	0	0	1,590	60
Oregon areas	67,840	92,700	72,120	71,540	90,040
Washington:					
Colville N.F.	0	3,690	9,280	4,820	1,700
Gifford Pinchot National Forest	98,330	31,300	12,870	3,720	5,520
Kaniksu N.F.	1,290	10,440	3,480	2,120	1,450
Mt. Baker N.F.	43,060	4,270	1,440	8,320	4,650
Okanogan N.F.	1,000	130	840	1,560	100
Olympic N.F.	23,600	15,870	7,960	2,320	600
Snoqualmie N.F.	32,060	22,640	11,960	9,100	8,440
Wenatchee N.F.	79,280	20,640	40,520	21,640	23,040
Quinault I.R.	7,040	2,180	5,320	4,750	16,300
Spokane I.R.	0	0	0	240	0
Yakima I.R.	540	1,040	2,920	1,920	1,940
Mt. Rainier N.P.	9,740	4,240	1,920	880	920
Olympic N.P.	114,600	57,270	26,940	12,980	9,620
Northwest Washington District	0	1,560	0	0	0
Northeast Washington District	0	720	0	40	0
Glenwood District	0	0	1,160	0	0
Puget Sound District	0	0	720	0	0
Washington areas	410,540	175,990	127,330	74,410	74,280
Regional total	478,380	268,690	199,450	145,950	164,320

1/ N.F., National Forest; I.R., Indian Reservation; N.P., National Park

Table 13.--Extent of mountain pine beetle infestations on western white pine in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Deschutes N.F.	4	140	0	0	0	140
Mt. Hood N.F.	65	5,640	1,400	360	110	7,510
Rogue River N.F.	8	570	150	0	0	720
Siskiyou N.F.	11	800	0	0	0	800
Umpqua N.F.	83	6,950	1,040	1,290	0	9,280
Willamette N.F.	247	38,600	18,810	8,830	4,100	70,340
Winema N.F.	4	470	190	0	0	660
Warm Springs I.R.	5	210	0	320	0	530
Crater Lake N.P.	1	60	0	0	0	60
Oregon areas	428	53,440	21,590	10,800	4,210	90,040
Washington:						
Gifford Pinchot National Forest	21	2,480	2,560	120	360	5,520
Mt. Baker N.F.	19	1,810	2,680	160	0	4,650
Okanogan N.F.	1	100	0	0	0	100
Olympic N.F.	4	440	160	0	0	600
Snoqualmie N.F.	28	4,720	3,280	440	0	8,440
Wenatchee N.F.	88	11,520	5,220	4,540	1,760	23,040
Colville N.F.	3	180	400	560	560	1,700
Kaniksu N.F.	9	1,130	320	0	0	1,450
Quinault I.R.	10	12,620	920	2,280	480	16,300
Yakima I.R.	6	1,100	330	510	0	1,940
Mt. Rainier N.P.	5	920	0	0	0	920
Olympic N.P.	46	5,260	3,200	820	340	9,620
Washington areas	240	42,280	19,070	9,430	3,500	74,280
Regional total	668	95,720	40,660	20,230	7,710	164,320

1/ N.F., National Forest; I.R., Indian Reservation; N.P.; National Park

Table 14.--Trend of mountain pine beetle infestations in ponderosa pine in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	280	120	2,550	1,000	1,460
Fremont N.F.	4,970	2,920	16,740	8,150	5,310
Malheur N.F.	1,760	6,730	29,170	4,040	2,700
Mt. Hood N.F.	0	30	50	900	1,680
Ochoco N.F.	700	1,340	2,370	630	2,090
Rogue River N.F.	940	1,840	170	370	1,510
Siskiyou N.F.	0	1,600	1,290	260	80
Umatilla N.F.	3,080	4,680	3,140	1,460	2,360
Umpqua N.F.	830	0	120	200	250
Wallowa-Whitman National Forest	18,680	21,400	48,410	28,480	22,360
Winema N.F.	160	910	4,910	5,590	2,320
Umatilla I.R.	0	80	20	80	120
Warm Springs I.R.	160	70	0	320	200
Crater Lake N.P.	0	200	0	0	0
Central Oregon Dist.	660	520	680	2,510	650
Coos-Douglas Dist.	0	0	0	240	0
Oregon areas	32,220	42,440	109,620	54,230	43,090
Washington:					
Colville N.F.	200	2,530	3,280	2,080	2,090
Gifford Pinchot National Forest	0	160	0	0	0
Okanogan N.F.	0	6,480	15,400	12,040	11,970
Snoqualmie N.F.	0	0	280	0	0
Umatilla N.F.	430	1,270	4,280	1,030	140
Wenatchee N.F.	520	120	580	860	960
Colville I.R.	0	2,070	1,010	4,000	980
Spokane I.R.	0	0	280	200	350
Yakima I.R.	0	680	6,780	720	130
Northeast Washington District	0	0	0	240	610
Glenwood District	0	520	40	560	1,060
Washington areas	1,150	13,830	31,930	21,730	18,290
Regional total	33,370	56,270	141,550	75,960	61,380

1/ N.F., National Forest; I.R., Indian Reservation; N.P., National Park

Table 15.--Extent of mountain pine beetle infestations on ponderosa pine in Oregon and Washington in 1967 by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Oregon:						
Deschutes N.F.	20	1,280	180	0	0	1,460
Fremont N.F.	51	4,820	210	280	0	5,310
Malheur N.F.	29	1,430	760	510	0	2,700
Mt. Hood N.F.	12	1,040	640	0	0	1,680
Ochoco N.F.	26	1,700	70	320	0	2,090
Rogue River N.F.	9	1,510	0	0	0	1,510
Siskiyou N.F.	1	80	0	0	0	80
Umatilla N.F.	25	790	1,410	0	160	2,360
Umpqua N.F.	1	250	0	0	0	250
Wallowa-Whitman National Forest	76	6,900	8,430	4,950	2,080	22,360
Winema N.F.	19	2,240	80	0	0	2,320
Umatilla I.R.	2	20	0	100	0	120
Warm Springs I.R.	2	200	0	0	0	200
Central Oregon Dist.	2	50	0	600	0	650
Oregon areas	275	22,310	11,780	6,760	2,240	43,090
Washington:						
Okanogan N.F.	62	2,020	5,080	3,190	1,680	11,970
Umatilla N.F.	5	100	40	0	0	140
Wenatchee N.F.	4	120	440	400	0	960
Colville N.F.	9	280	470	1,160	180	2,090
Colville I.R.	8	340	640	0	0	980
Spokane I.R.	2	80	110	160	0	350
Yakima I.R.	2	130	0	0	0	130
Northeast Wash. District	4	490	0	120	0	610
Glenwood Dist.	6	600	460	0	0	1,060
Washington areas	102	4,160	7,240	5,030	1,860	18,290
Regional total	337	26,470	19,020	11,790	4,100	61,380

1/ N.F., National Forest; I.R., Indian Reservation

Table 16.--Trend of mountain pine beetle infestations in sugar pine in Oregon, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	0	40	50	440	0
Fremont N.F.	0	0	1,640	0	0
Rogue River N.F.	0	490	130	1,200	520
Siskiyou N.F.	0	1,030	4,110	300	180
Umpqua N.F.	0	0	0	70	300
Winema N.F.	0	0	20	360	0
Coos-Douglas Dist.	0	4,600	160	0	0
Oregon areas	0	6,160	6,110	2,370	1,000
Regional total	0	6,160	6,110	2,370	1,000

1/ N.F., National Forest

Table 17.--Extent of mountain pine beetle infestations on sugar pine in Oregon in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number	Acres				
Oregon:						
Rogue River N.F.	7	520	0	0	0	520
Siskiyou N.F.	4	180	0	0	0	180
Umpqua N.F.	2	300	0	0	0	300
Oregon areas	13	1,000	0	0	0	1,000
Regional total	13	1,000	0	0	0	1,000

1/ N.F., National Forest

DOUGLAS-FIR BEETLE, *Dendroctonus pseudotsugae* Hopk.

Host: Douglas-fir.

Damage: Douglas-fir beetle damage increased in Oregon and Washington west of the Cascade Mountains (table 18). In Oregon, 75 percent of the losses occurred on the Illinois Valley District, Siskiyou National Forest, and on the Applegate District, Rogue River National Forest. In western Washington, most of the mortality was detected on the Gifford Pinchot National Forest (table 19).

Tree killing east of the Cascade Mountains increased in Washington and decreased in Oregon (table 20). Ninety-four percent of the losses occurred in Washington with 69 percent of this damage located on the Okanogan and Colville National Forests (table 21). Significant killing was also detected on the Colville Indian Reservation. In Oregon, most of the damage occurred on the Wallowa-Whitman National Forest.

Trend: A downward trend is expected in the westside Douglas-fir stands and an upward trend in the eastside Douglas-fir stands.

The present increase of losses on the Rogue River and Siskiyou National Forests is the result of the 1964-65 floods. These floods weakened many trees along stream banks, caused earth slides, and provided many breeding sites for the beetles.

Control: Continued salvage of infested trees and recently windthrown trees will help reduce beetle populations and save timber values that would otherwise be lost.

Table 18.--Trend of Douglas-fir beetle infestations in westside Douglas-fir in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Mt. Hood N.F.	0	450	400	760	580
Rogue River N.F.	3,560	240	2,580	2,240	9,420
Siskiyou N.F.	320	6,760	15,200	2,460	16,160
Siuslaw N.F.	540	17,890	54,080	9,360	4,600
Umpqua N.F.	4,100	2,360	30,260	1,820	5,960
Willamette N.F.	410	720	17,850	9,310	3,070
Crater Lake N.P.	30	0	0	0	0
Coos-Douglas Dist.	0	19,630	69,720	19,310	7,700
Northwest Oregon Dist.	0	0	1,400	20	220
Oregon areas	8,960	48,050	191,490	45,280	47,710
Washington:					
Gifford Pinchot National Forest	1,880	460	2,930	2,980	13,240
Mt. Baker N.F.	400	0	160	200	2,220
Olympic N.F.	120	0	440	80	0
Snoqualmie N.F.	850	230	2,260	680	0
Puget Sound Dist.	0	0	440	0	0
Northwest Wash. District	0	0	40	0	0
Southwest Wash. District	0	0	3,680	1,280	240
Olympic N.P.	320	80	80	0	260
Washington areas	3,570	770	10,030	5,220	15,960
Regional total	12,530	48,820	201,520	50,500	63,670

1/ N.F., National Forest; N.P., National Park

Table 19.--Extent of Douglas-fir beetle infestations on westside Douglas-fir in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Mt. Hood N.F.	10	320	130	130	0	580
Rogue River N.F.	131	6,940	1,820	660	0	9,420
Siskiyou N.F.	170	11,510	3,410	1,240	0	16,160
Siuslaw N.F.	85	2,620	1,300	680	0	4,600
Umpqua N.F.	75	4,190	1,650	120	0	5,960
Willamette N.F.	72	2,720	190	160	0	3,070
Northwest Oregon District	4	220	0	0	0	220
Coos-Douglas Dist.	96	5,300	2,120	280	0	7,700
Oregon areas	643	33,820	10,620	3,270	0	47,710
Washington:						
Gifford Pinchot National Forest	54	6,100	4,000	3,060	80	13,240
Mt. Baker N.F.	8	520	1,540	160	0	2,220
Southwest Wash. District	4	240	0	0	0	240
Olympic N.P.	3	100	160	0	0	260
Washington areas	69	6,960	5,700	3,220	80	15,960
Regional total	712	40,780	16,320	6,490	80	63,670

1/ N.F., National Forest; N.P., National Park

Table 20.--Trend of Douglas-fir beetle infestations in eastside Douglas-fir in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Malheur N.F.	240	810	6,160	1,250	0
Ochoco N.F.	860	470	550	110	0
Umatilla N.F.	1,560	10,640	1,900	420	100
Wallowa-Whitman National Forest	12,510	52,220	20,710	1,910	2,280
Winema N.F.	210	0	0	0	0
Umatilla I.R.	80	0	0	70	0
Warm Springs I.R.	20	0	50	0	0
Central Oregon District	110	0	0	210	10
Lookout Mt. Dist.	0	0	0	620	10
Oregon areas	15,590	64,140	29,370	4,590	2,400
Washington:					
Colville N.F.	8,240	4,630	8,780	4,860	16,170
Kaniksu N.F.	160	360	180	80	330
Okanogan N.F.	31,950	6,830	12,160	10,400	11,500
Umatilla N.F.	500	2,710	0	0	50
Wenatchee N.F.	4,280	760	1,120	200	640
Colville I.R.	11,460	2,050	2,300	4,440	7,940
Spokane I.R.	70	0	0	160	0
Yakima I.R.	320	0	0	0	0
Glenwood District	90	0	280	2,160	820
Northeast Wash. District	60	0	120	0	0
Washington areas	57,130	17,340	24,940	22,300	37,450
Regional total	72,720	81,480	54,310	26,890	39,850

1/ N.F., National Forest; I.R., Indian Reservation

Table 21.--Extent of Douglas-fir beetle infestations on eastside Douglas-fir in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Umatilla N.F.	3	100	0	0	0	100
Wallowa-Whitman National Forest	55	1,550	730	0	0	2,280
Central Oregon District	1	10	0	0	0	10
Lookout Mt. Dist.	1	10	0	0	0	10
Oregon areas	60	1,670	730	0	0	2,400
Washington:						
Okanogan N.F.	67	4,050	3,770	2,760	920	11,500
Umatilla N.F.	1	50	0	0	0	50
Wenatchee N.F.	2	600	40	0	0	640
Colville N.F.	104	3,360	5,340	5,750	1,720	16,170
Kaniksu N.F.	3	170	160	0	0	330
Colville I.R.	66	2,940	2,860	1,620	520	7,940
Glenwood Dist.	4	580	240	0	0	820
Washington areas	247	11,750	12,410	10,130	3,160	37,450
Regional total	307	13,420	13,140	10,130	3,160	39,850

1/ N.F., National Forest; I.R., Indian Reservation

OREGON PINE IPS, *Ips pini* Say

Host: Ponderosa pine.

Damage: The total infested acreage increased 12 times over the loss recorded in 1966 (table 22). Most of the damage occurred in second-growth ponderosa pine stands. Infestations in Oregon accounted for 98 percent of the Regional losses with 56 percent of the damage located on the Wallowa-Whitman National Forest. Tree killing in Washington was detected on four different Forests, but losses never exceeded 400 acres on any one of the Forests (table 23).

Trend: Indications are that ips losses will be higher next year. Some of this loss will be due to the 1967 drought and the abundance of scorched trees around recent fires.

Control: Because outbreaks develop and subside rapidly, control is generally not recommended.

Table 22.--Trend of Oregon pine ips infestations in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	330	150	950	20	280
Fremont N.F.	1,890	540	170	70	2,760
Malheur N.F.	5,150	2,200	4,360	630	9,780
Mt. Hood N.F.	570	1,000	70	80	2,680
Ochoco N.F.	220	740	3,730	860	1,330
Rogue River N.F.	250	880	420	1,140	2,070
Siskiyou N.F.	80	0	270	390	350
Umatilla N.F.	1,470	0	30	0	2,190
Wallowa-Whitman National Forest	3,410	40	3,820	0	30,810
Willamette N.F.	0	0	0	0	20
Winema N.F.	1,790	1,820	1,780	0	950
Umatilla I.R.	0	0	110	0	260
Warm Springs I.R.	190	0	130	0	1,530
Central Oregon Dist.	230	0	160	680	120
Coos-Douglas Dist.	0	0	0	0	40
Oregon areas	15,580	7,370	16,000	3,870	55,170
Washington:					
Colville N.F.	200	330	140	0	0
Okanogan N.F.	590	0	800	120	370
Snoqualmie N.F.	0	10	0	0	0
Umatilla N.F.	520	120	0	0	310
Wenatchee N.F.	0	160	740	240	0
Colville I.R.	0	740	320	0	0
Spokane I.R.	0	200	320	0	130
Yakima I.R.	1,160	0	560	280	0
Glenwood District	130	520	60	0	0
Northeast Wash. District	0	0	160	0	90
Washington areas	2,600	2,080	3,100	640	900
Regional total	18,180	9,450	19,100	4,510	56,070

1/ N.F., National Forest; I.R., Indian Reservation

Table 23.--Extent of Oregon pine ips infestations in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Oregon:						
Deschutes N.F.	8	280	0	0	0	280
Fremont N.F.	35	940	910	910	0	2,760
Malheur N.F.	118	3,650	2,060	1,140	2,930	9,780
Mt. Hood N.F.	42	1,080	1,260	290	50	2,680
Ochoco N.F.	23	880	310	70	70	1,330
Rogue River N.F.	24	1,540	530	0	0	2,070
Siskiyou N.F.	3	350	0	0	0	350
Umatilla N.F.	75	1,540	590	20	40	2,190
Wallowa-Whitman National Forest	266	9,800	13,730	4,910	2,370	30,810
Willamette N.F.	2	20	0	0	0	20
Winema N.F.	12	470	100	380	0	950
Umatilla I.R.	6	80	180	0	0	260
Warm Springs I.R.	13	310	440	0	780	1,530
Central Oregon District	5	120	0	0	0	120
Coos-Douglas Dist.	1	40	0	0	0	40
Oregon areas	633	21,100	20,110	7,720	6,240	55,170
Washington:						
Okanogan N.F.	2	370	0	0	0	370
Umatilla N.F.	7	80	230	0	0	310
Spokane I.R.	1	130	0	0	0	130
Northeast Wash. District	1	90	0	0	0	90
Washington areas	11	670	230	0	0	900
Regional total	644	21,770	20,340	7,720	6,240	56,070

1/ N.F., National Forest; I.R., Indian Reservation

WESTERN PINE BEETLE, *Dendroctonus brevicomis* Lec.

Host: Ponderosa pine.

Damage: Western pine beetle epidemics increased in many areas of eastern Oregon and decreased in eastern Washington. Scattered tree killing was observed throughout most pine stands in both States. In Oregon, 54 percent of the State's losses occurred on three National Forests--Fremont, Malheur, and Ochoco (table 24). Significant damage was also reported on the Warm Springs Indian Reservation and the Rogue River National Forest. The most extensive tree killing in Washington occurred on the Yakima Indian Reservation (table 25).

Trend: Static to upward in both States.

Control: Increased sanitation-salvage programs in overmature ponderosa pine stands should hold tree killing to a minimum. Logging infested trees aids in reducing beetle populations.

Table 24.--Trend of western pine beetle infestations in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	2,950	5,010	4,780	3,470	6,200
Fremont N.F.	43,900	15,990	30,760	6,650	12,430
Malheur N.F.	14,790	42,180	26,770	14,730	9,640
Mt. Hood N.F.	1,530	0	60	260	1,330
Ochoco N.F.	5,040	16,870	14,760	6,070	12,850
Rogue River N.F.	4,430	1,180	1,200	640	7,090
Siskiyou N.F.	130	3,120	1,350	210	900
Umatilla N.F.	5,070	8,170	4,880	1,760	1,250
Umpqua N.F.	1,260	740	0	0	20
Wallowa-Whitman National Forest	4,510	5,480	6,410	740	2,270
Willamette N.F.	360	0	0	0	0
Winema N.F.	13,160	9,960	11,710	2,260	6,420
Umatilla I.R.	50	0	0	0	0
Warm Springs I.R.	480	440	1,480	880	5,240
Central Oregon Dist.	730	0	440	150	90
Coos-Douglas Dist.	0	2,170	0	0	100
Crater Lake N.P.	0	0	0	0	40
Oregon areas	98,390	111,310	104,600	37,820	65,870
Washington:					
Colville N.F.	2,160	920	1,760	0	0
Gifford Pinchot National Forest	3,840	2,400	0	0	480
Okanogan N.F.	7,500	3,810	3,640	1,380	470
Snoqualmie N.F.	0	0	1,180	0	0
Umatilla N.F.	80	510	0	110	70
Wenatchee N.F.	6,890	1,740	5,160	4,160	240
Colville I.R.	320	2,120	3,360	1,120	920
Spokane I.R.	0	1,280	1,280	120	0
Yakima I.R.	9,560	10,480	7,320	2,200	3,150
Glenwood District	8,860	840	940	520	1,400
Northeast Wash. District	60	0	280	0	0
Washington areas	39,270	24,100	24,920	9,610	6,730
Regional total	137,660	135,410	129,520	47,430	72,600

1/ N.F., National Forest; N.P., National Park; I.R., Indian Reservation

Table 25.--Extent of western pine beetle infestations in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Oregon:						
Deschutes N.F.	32	5,050	1,150	0	0	6,200
Fremont N.F.	90	10,870	1,560	0	0	12,430
Malheur N.F.	47	5,500	4,140	0	0	9,640
Mt. Hood N.F.	10	1,330	0	0	0	1,330
Ochoco N.F.	56	11,170	720	960	0	12,850
Rogue River N.F.	60	5,120	1,590	380	0	7,090
Siskiyou N.F.	12	560	340	0	0	900
Umatilla N.F.	27	1,090	0	160	0	1,250
Umpqua N.F.	1	20	0	0	0	20
Wallowa-Whitman National Forest	31	2,050	220	0	0	2,270
Winema N.F.	30	6,420	0	0	0	6,420
Warm Springs I.R.	16	2,900	1,740	600	0	5,240
Central Oregon Dist.	3	50	40	0	0	90
Coos-Douglas Dist.	1	100	0	0	0	100
Crater Lake N.P.	2	40	0	0	0	40
Oregon areas	418	52,270	11,500	2,100	0	65,870
Washington:						
Gifford Pinchot National Forest	1	480	0	0	0	480
Okanogan N.F.	4	330	140	0	0	470
Umatilla N.F.	1	70	0	0	0	70
Wenatchee N.F.	3	160	80	0	0	240
Colville I.R.	2	920	0	0	0	920
Yakima I.R.	11	1,950	1,200	0	0	3,150
Glenwood District	4	1,400	0	0	0	1,400
Washington areas	26	5,310	1,420	0	0	6,730
Regional total	444	57,580	12,920	2,100	0	72,600

1/ N.F., National Forest; I.R., Indian Reservation; N.P., National Park

FIR ENGRAVER, *Scolytus ventralis* Lec.

Hosts: Grand fir, subalpine fir, and white fir.

Damage: Infestations in Oregon accounted for 88 percent of the losses in the Northwest (table 26). In Oregon, 66 percent of the outbreaks were found on the Wallowa-Whitman and Umatilla National Forests. Losses in Washington remained static with most of the tree killing occurring on the Okanogan National Forest (table 27).

Trend: Probably upward. Beetle activities increase during drought periods. The 1967 drought in Oregon, the longest on record, is expected to favor an increase in damage caused by the fir engraver.

Control: Control, other than logging merchantable, infested trees, is seldom necessary because fir engravers usually subside when moisture conditions return to normal. Spotting infested trees is difficult since broods frequently develop and emerge without killing the trees.

Table 26.--Trend of fir engraver infestations

Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Deschutes N.F.	430	290	60	0	40
Fremont N.F.	33,110	39,050	5,260	280	540
Malheur N.F.	1,810	5,090	5,400	450	490
Mt. Hood N.F.	620	120	270	580	580
Ochoco N.F.	1,840	9,930	8,770	810	1,710
Rogue River N.F.	80	1,170	270	730	2,130
Siskiyou N.F.	0	0	0	0	240
Umatilla N.F.	8,660	24,040	22,200	4,100	7,370
Umpqua N.F.	0	0	0	30	0
Wallowa-Whitman N.F.	8,370	36,120	19,310	3,360	11,760
Willamette N.F.	660	0	0	260	0
Winema N.F.	1,040	3,400	1,570	550	210
Umatilla I.R.	0	180	530	60	20
Warm Springs I.R.	50	0	0	0	160
Crater Lake N.P.	30	40	10	0	0
Central Oregon Dist.	1,580	710	150	270	290
Lookout Mt. Dist	0	480	0	0	10
Steens Mt. Dist.	0	200	0	0	0
Oregon areas	58,280	120,820	63,800	11,480	25,550
Washington:					
Colville N.F.	880	490	2,580	180	100
Gifford Pinchot N.F.	160	0	100	0	0
Kaniksu N.F.	0	2,840	280	120	0
Mt. Baker N.F.	940	280	0	160	0
Okanogan N.F.	4,190	3,510	3,200	1,880	1,120
Snoqualmie N.F.	880	840	0	40	0
Umatilla N.F.	3,610	4,000	11,880	2,290	1,470
Wenatchee N.F.	5,040	2,860	3,340	1,120	320
Colville I.R.	0	80	490	80	160
Yakima I.R.	160	320	120	0	130
Glenwood District	0	0	0	0	280
Washington areas	15,860	15,220	21,990	5,870	3,580
Regional total	74,140	136,040	85,790	17,350	29,130

1/ N.F., National Forest; N.P., National Park; I.R., Indian Reservation

Table 27.--Extent of fir engraver infestations in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Deschutes N.F.	1	40	0	0	0	40
Fremont N.F.	8	330	210	0	0	540
Malheur N.F.	12	460	30	0	0	490
Mt. Hood N.F.	12	520	60	0	0	580
Ochoco N.F.	12	620	370	200	520	1,710
Rogue River N.F.	16	2,130	0	0	0	2,130
Siskiyou N.F.	4	240	0	0	0	240
Umatilla N.F.	102	2,980	2,970	780	640	7,370
Wallowa-Whitman National Forest	115	5,970	3,930	1,800	60	11,760
Winema N.F.	2	210	0	0	0	210
Umatilla I.R.	2	20	0	0	0	20
Warm Springs I.R.	4	160	0	0	0	160
Central Oregon District	8	290	0	0	0	290
Lookout Mt. Dist.	1	10	0	0	0	10
Oregon areas	299	13,980	7,570	2,780	1,220	25,550
Washington:						
Okanogan N.F.	8	360	390	370	0	1,120
Umatilla N.F.	31	1,200	270	0	0	1,470
Wenatchee N.F.	2	320	0	0	0	320
Colville N.F.	1	0	100	0	0	100
Colville I.R.	1	0	0	160	0	160
Yakima I.R.	1	130	0	0	0	130
Glenwood Dist.	2	280	0	0	0	280
Washington areas	46	2,290	760	530	0	3,580
Regional total	345	16,270	8,330	3,310	1,220	29,130

1/ N.F., National Forest; I.R., Indian Reservation

SILVER FIR BEETLES, *Pseudohylesinus* spp.

Host: Pacific silver fir.

Damage: Outbreaks of these beetles subsided (table 28). Epidemic outbreaks occurred on several areas of the Mt. Baker and Snoqualmie National Forests in Washington (table 29). Many of the infested areas are also heavily infected with *Armillaria mellea* root rot. For the fifth consecutive year, no outbreaks were reported in Oregon.

Trend: Presumably downward.

Control: No control other than logging infested trees and those of declining thrift in outbreak centers is needed in 1968.

Table 28.--Trend of silver fir beetles infestations in Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Washington:					
Gifford Pinchot N.F.	200	0	0	120	0
Mt. Baker N.F.	51,120	520	5,660	9,740	4,650
Olympic N.F.	0	0	1,440	400	640
Snoqualmie N.F.	3,360	560	1,260	1,000	1,400
Southwest Wash. District	0	0	0	120	80
Olympic N.P.	0	150	920	1,120	280
Mt. Rainier N.P.	160	0	0	0	0
Washington areas	54,840	1,230	9,280	12,500	7,050
Regional total	54,840	1,230	9,280	12,500	7,050

1/ N.F., National Forest; N.P., National Park

Table 29.--Extent of silver fir beetles infestations in Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Washington:						
Mt. Baker N.F.	17	2,260	2,390	0	0	4,650
Olympic N.F.	3	640	0	0	0	640
Snoqualmie N.F.	7	1,160	240	0	0	1,400
Southwest Wash. District	1	80	0	0	0	80
Olympic N.P.	2	160	120	0	0	280
Washington areas	30	4,300	2,750	0	0	7,050
Regional total	30	4,300	2,750	0	0	7,050

1/ N.F., National Forest; N.P., National Park

ENGELMANN SPRUCE BEETLE, *Dendroctonus obesus* (Mann.)

Host: Engelmann spruce.

Damage: Infestations remained static in Washington with most of the tree killing centered on the Okanogan National Forest (table 30). In Oregon, all of the losses occurred on the Wallowa-Whitman and Umatilla National Forests (table 31). Most of the infested acreage in both States is found at high elevations and in inaccessible areas.

Trend: Static in both Washington and Oregon.

Control: None is needed. In accessible stands, infested merchantable trees should be salvaged to reduce beetle populations.

Table 30.--Trend of Engelmann spruce beetle infestations in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Malheur N.F.	0	0	0	310	0
Umatilla N.F.	1,420	840	190	520	300
Wallowa-Whitman National Forest	2,690	2,760	7,220	5,340	2,870
Oregon areas	4,110	3,600	7,410	6,170	3,170
Washington:					
Colville N.F.	0	0	0	160	240
Kaniksu N.F.	0	0	0	0	390
Okanogan N.F.	4,890	280	380	2,000	3,760
Snoqualmie N.F.	1,480	0	0	0	0
Umatilla N.F.	4,040	320	310	30	140
Wenatchee N.F.	600	0	3,080	1,840	120
Colville I.R.	0	0	0	160	0
Yakima I.R.	0	0	0	240	0
Washington areas	11,010	600	3,770	4,430	4,650
Regional total	15,120	4,200	11,180	10,600	7,820

1/ N.F., National Forest; I.R., Indian Reservation

Table 31.--Extent of Engelmann spruce beetle infestations in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Umatilla N.F.	6	230	70	0	0	300
Wallowa-Whitman National Forest	16	840	1,530	500	0	2,870
Oregon areas	22	1,070	1,600	500	0	3,170
Washington:						
Okanogan N.F.	15	1,600	1,340	620	200	3,760
Umatilla N.F.	3	90	50	0	0	140
Wenatchee N.F.	1	120	0	0	0	120
Colville N.F.	2	240	0	0	0	240
Kaniksu N.F.	3	390	0	0	0	390
Washington areas	24	2,440	1,390	620	200	4,650
Regional total	46	3,510	2,990	1,120	200	7,820

1/ N.F., National Forest

CONE AND SEED INSECTS

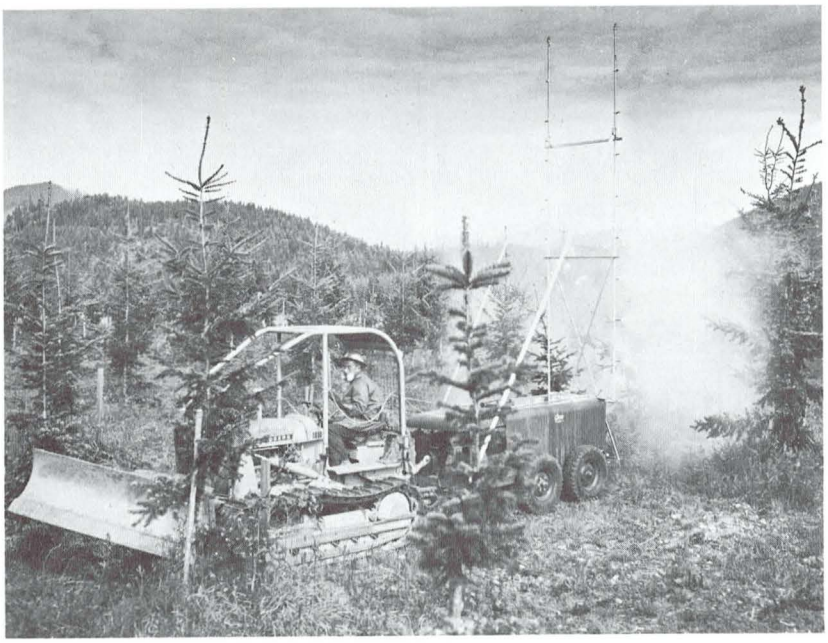
The detection and evaluation of cone and seed insects have become important with the establishment of Douglas-fir production areas on many of the westside National Forests. Some of the major cone and seed insects causing problems are as follows:

Common Name	
Douglas-fir cone midge	*Contarinia oregonensis* Foote
Scale midge	*Contarinia washingtonensis* Johnson
Douglas-fir cone moth	*Barbara colfaxiana* (Kearf.)
Fir cone worm	*Dioryctria abietella* (D. & S.)
Douglas-fir seed chalcid	*Megastigmus spermatrophus* Wachtl

The 1966 Douglas-fir cone crop was generally very good and the seeds were viable. The seed and cone insects were attracted but scattered and absorbed by the plentiful crop and their damage was considered to be light. In contrast the 1967 crop was very light and the lack of pollen reduced filled seed numbers. Cones at the Siskiyou and Olympic National Forests seed areas were heavily infested with cone midges. Cone moths continue to reduce seed yield at the Peavine seed production area on the Rogue River National Forest. The lack of filled seed reduced Douglas-fir seed chalcid impact. Remaining seed production areas contained so few cones that it would be too costly to collect and evaluate the insect problems.

A limited cone and seed insect control project was carried on at Buckhead seed production area an the Willamette National Forest. A one percent dimethoate spray was applied by ground hydraulic equipment. Total seed loss of the unsprayed cones amounted to 60 percent while the sprayed cones sustained an 8 percent loss.

Early indications reveal that the Douglas-fir cone crop in 1968 might be heavy. Pollen production in some areas is also expected to be heavy.



Spraying to control Douglas-fir cone and seed insects in a seed orchard.

OTHER FOREST PEST PROBLEMS

A TENT CATERPILLAR, *Malacosoma* sp.

Larval feeding caused moderate to heavy defoliation on red alder in the Coast Range of Oregon from the Columbia River south to the Coquille River (table 32). Some defoliation is expected in 1968. Control is not needed since parasites usually check most outbreaks before any tree killing occurs.

HEMLOCK SAWFLY, *Neodiprion tsugae* Midd

Very light defoliation of western hemlock occurred on the Bear Springs District, Mt. Hood National Forest, Oregon, and around Spirit Lake on the Gifford Pinchot National Forest, Washington. The trend is undetermined, but is presumed to be downward. No control is needed in 1968. High parasitism should hold tree damage to a low level.

SAWFLIES, *Neodiprion* spp.

Moderate but limited damage occurred in true fir stands on the Winema and Mt. Hood National Forest in Oregon (table 33). A different *Neodiprion* sawfly was found defoliating knobcone pine on the Siskiyou National Forests (table 34). The trend is unknown for either of the two species. Control is seldom necessary as parasites usually check most sawfly outbreaks in a year or two.

BLACK-HEADED BUDWORM, *Acleris variana* (Fern.)

In several true fir and Douglas-fir stands, very light populations exist on the Mt. Hood National Forest in Oregon and on the Gifford Pinchot National Forest in Washington. Elsewhere, this insect was more prevalent than normal, but it caused no damage. No large outbreaks are expected in 1968.

DOUGLAS-FIR TUSSOCK MOTH, *Hemerocampa pseudotsugata* McD.

Douglas-fir tussock moth was not found at any of the 30 permanent ground plots in Oregon and Washington. These plots were established in 1966 and have been visited annually to detect very light tussock moth and other defoliator populations.

SPRUCE BUDWORM, *Choristoneura fumiferana* (Clem.)

Spruce budworm was not detected in either Oregon or Washington. The same 60 plots used for the Douglas-fir tussock moth ground surveys are used for the spruce budworm.

SPRUCE APHID, *Neomyzaphis abietina* (Wlkr.)

Spruce aphid caused light defoliation to Sitka spruce along the Columbia River in Oregon and Washington. The trend is unknown. Control is not needed in 1968.

GREEN-STRIPED FOREST LOOPER, *Melanophia imitata* (Wlkr.)

The green-striped forest looper was found on several of the hemlock looper plots in Oregon and Washington, but no serious defoliation is expected in 1968.

CYPRESS TIP MOTH, *Argyresthia* prob. *franciscella* Busck

A Cypress tip moth caused light to moderate defoliation of western redcedar in the Ozette Lake area of the Olympic National Park, Washington. Severe tree damage has not occurred, nor is any expected. Moth populations should lower next year due to high larval parasitism.

Table 32.--Extent of forest tent caterpillar infestations in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Siuslaw N.F.	4	110	3,641	0	0	3,751
Northwest Oregon District	4	0	7,240	0	0	7,240
Oregon areas	8	110	10,881	0	0	10,991
Regional total	8	110	10,881	0	0	10,991

1/ N.F., National Forest

Table 33.--Extent of sawfly infestations on true firs in Oregon in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Mt. Hood N.F.	1	1,200	0	0	0	1,200
Winema N.F.	1	0	210	710	0	920
Warm Springs I.R.	1	2,280	0	0	0	2,280
Oregon areas	3	3,480	210	710	0	4,400
Regional total	3	3,480	210	710	0	4,400

1/ N.F., National Forest; I.R., Indian Reservation

Table 34.--Extent of sawfly infestations on knob-cone pine in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Oregon:						
Siskiyou N.F.	15	320	2,380	1,700	1,620	6,020
Oregon areas	15	320	2,380	1,700	1,620	6,020
Regional total	15	320	2,380	1,700	1,620	6,020

1/ N.F., National Forest

ALDER FLEA BEETLE, *Altica ambiens* (LeC.)

Light larval feeding was observed on red alder in the Coast Range in Oregon. Continued defoliation is expected in localized areas in 1968. Control is seldom necessary since most outbreaks subside before tree mortality occurs.

DOUGLAS-FIR ENGRAVER, *Scolytus unispinosus* (LeC.)

Several epidemics of the Douglas-fir engraver were detected in Oregon on the Siuslaw and Umpqua National Forests (table 35). The damage occurs in the tops of Douglas-firs. The trend is expected to remain static next year. Small drought-weakened trees in plantations were killed by the beetle on the Willamette National Forest. Control efforts against this pest are limited to salvaging accessible, merchantable, infested trees and those of declining thrift in the outbreak centers.

Table 35.--Extent of Douglas-fir engraver infestations in Oregon in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Oregon:						
Siuslaw N.F.	2	200	0	0	0	200
Umpqua N.F.	1	20	0	0	0	20
Oregon areas	3	220	0	0	0	220
Regional total	3	220	0	0	0	220

1/ N.F., National Forest

DYING HEMLOCK

The acreage of mature and overmature western hemlock dying from unknown causes decreased slightly (table 36). The majority of the dying hemlock was found on the Mt. Baker and Olympic National Forests and the Olympic National Park (table 37). Two small centers of dying hemlock were found on the Gifford Pinchot National Forest.

Table 36.--Trend of dying hemlock in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Northwest Oregon District	3,820	0	0	80	0
Siuslaw N.F.	0	0	0	0	0
Oregon areas	3,820	0	0	80	0
Washington:					
Gifford Pinchot N.F.	0	0	0	0	170
Mt. Baker N.F.	42,760	115,340	57,690	41,160	21,920
Olympic N.F.	80,720	60,830	16,040	6,680	17,940
Olympic N.P.	32,480	21,450	5,200	5,480	4,680
Snoqualmie N.F.	2,560	0	2,480	2,200	0
Southwest Wash. District	0	0	2,080	240	0
Northwest Wash. District	0	5,840	2,000	0	0
Quinault I.R.	1,800	0	0	0	0
Washington areas	160,320	203,460	85,490	55,760	44,710
Regional total	164,140	203,460	85,490	55,840	44,710

1/ N.F., National Forest; N.P., National Park; I.R., Indian Reservation

Table 37.--Extent of dying hemlock in Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Washington:						
Gifford Pinchot National Forest	2	120	50	0	0	170
Mt. Baker N.F.	31	12,840	8,560	520	0	21,920
Olympic N.F.	7	12,200	3,900	1,840	0	17,940
Olympic N.P.	5	3,440	1,240	0	0	4,680
Washington areas	45	28,600	13,750	2,360	0	44,710
Regional total	45	28,600	13,750	2,360	0	44,710

1/ N.F., National Forest; N.P., National Park

TREE DAMAGE BY BEARS

Tree damage and killing by bears in young Douglas-fir and western hemlock stands increased in Washington and decreased in Oregon (table 38). The seriousness of this problem is compounded by bears habitually working in understocked stands. Serious damage occurred on the Siuslaw and Willamette National Forests and on the Northwest Oregon District (table 39). In Washington the most seriously damaged areas were on the Gifford Pinchot, Olympic, and Snoqualmie National Forests and the Southwest Washington District. The outlook for next year is for little overall change with local areas increasing or decreasing in damage received.

Table 38.--Trend of tree damage by bears in Oregon and Washington, 1963-67

(In acres)

Reporting area 1/	Year				
	1963	1964	1965	1966	1967
Oregon:					
Mt. Hood N.F.	2,720	960	1,510	2,000	620
Siskiyou N.F.	0	80	0	0	0
Siuslaw N.F.	27,810	7,100	3,410	8,130	3,640
Umpqua N.F.	150	180	0	0	1,080
Willamette N.F.	2,250	7,200	2,100	5,270	2,750
Northwest Oregon District	32,610	37,770	10,330	20,560	10,260
Oregon areas	65,540	53,290	17,350	35,960	18,350
Washington:					
Gifford Pinchot National Forest	36,620	19,220	26,440	10,280	22,740
Olympic N.F.	59,800	32,390	30,320	5,200	20,860
Snoqualmie N.F.	18,730	6,760	10,420	1,960	2,560
Quinault I.R.	360	2,280	560	160	200
Yakima I.R.	0	240	0	280	0
Southwest Wash. District	34,560	12,390	12,200	18,160	18,380
Glenwood District	0	0	0	760	220
Puget Sound Dist.	0	0	260	0	0
Olympic N.P.	0	0	380	0	0
Mt. Rainier N.P.	0	0	0	0	90
Washington areas	150,070	73,280	80,580	36,800	65,050
Regional total	215,610	126,570	97,930	72,760	83,400

1/ N.F., National Forest; N.P., National Park; I.R., Indian Reservation

Table 39.--Extent of bear damage in Oregon and Washington in 1967, by reporting area and intensity of infestation

Reporting area 1/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Oregon:						
Mt. Hood N.F.	9	620	0	0	0	620
Siuslaw N.F.	43	3,170	470	0	0	3,640
Umpqua N.F.	3	1,080	0	0	0	1,080
Willamette N.F.	26	2,180	570	0	0	2,750
Northwest Oregon District	72	7,630	2,630	0	0	10,260
Oregon areas	153	14,680	3,670	0	0	18,350
Washington:						
Gifford Pinchot National Forest	33	14,240	7,700	520	280	22,740
Olympic N.F.	50	14,100	4,720	1,400	640	20,860
Snoqualmie N.F.	9	1,320	1,240	0	0	2,560
Quinault I.R.	1	200	0	0	0	200
Southwest Wash. District	34	11,480	4,680	1,380	840	18,380
Glenwood District	1	220	0	0	0	220
Mt. Rainier N.P.	1	0	90	0	0	90
Washington areas	129	41,560	18,430	3,300	1,760	65,050
Regional total	282	56,240	22,100	3,300	1,760	83,400

1/ N.F., National Forest; N.P., National Park; I.R., Indian Reservation

APPENDIX

Aerial surveys: The general aerial detection surveys were made in July and August. The surveys were coordinated by the U. S. Forest Service in cooperation with the Oregon State Department of Forestry and the Washington State Department of Natural Resources. Larch casebearer surveys in early June in northeastern Washington were coordinated with Region 1, U. S. Forest Service, Missoula Montana. Flying time for all aerial surveys totaled 222.8 hours (table 40).

Table 40.--Summary of cooperative aerial survey activities in 1967

Area covered	Timber area surveyed	Survey flight time: Mapping	Ferry	Total
	M acres	- - - Hours - - -		
Western Oregon	15,858	54.5	4.5	59.0
Eastern Oregon	14,881	48.2	7.6	55.8
All Oregon	30,739	102.7	12.1	114.8
Western Washington	13,061	36.1	6.2	42.3
Eastern Washington	9,989	51.4	14.3	65.7
All Washington	23,050	87.5	20.5	108.0
All areas	53,789	190.2	32.6	222.8

Table 41.--Extent of infestations in Oregon in 1967, by reporting area, insect species, and intensity of infestation

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Central Oregon District:						
Douglas-fir beetle	1	10	0	0	0	10
Fir engraver	8	290	0	0	0	290
Mountain pine beetle (P)	2	50	0	600	0	650
Oregon pine ips	5	120	0	0	0	120
Western pine beetle	3	50	40	0	0	90
All insects	19	520	40	600	0	1,160
All damage	19	520	40	600	0	1,160
Coos-Douglas District:						
Douglas-fir beetle	96	5,300	2,120	280	0	7,700
Oregon pine ips	1	40	0	0	0	40
Western pine beetle	1	100	0	0	0	100
All insects	98	5,440	2,120	280	0	7,840
All damage	98	5,440	2,120	280	0	7,840

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Crater Lake N.P.:						
Mountain pine beetle (L)	4	990	800	0	410	2,200
Mountain pine beetle (W)	1	60	0	0	0	60
Western pine beetle	2	40	0	0	0	40
Balsam woolly aphid	10	3,920	200	0	0	4,120
All insects	17	5,010	1,000	0	410	6,420
All damage	17	5,010	1,000	0	410	6,420
Deschutes N.F.:						
Fir engraver	1	40	0	0	0	40
Mountain pine beetle (L)	86	6,870	2,600	4,440	940	14,850
Mountain pine beetle (W)	4	140	0	0	0	140
Mountain pine beetle (P)	20	1,280	180	0	0	1,460
Oregon pine ips	8	280	0	0	0	280
Western pine beetle	32	5,050	1,150	0	0	6,200
Balsam woolly aphid	58	4,890	720	180	0	5,790
Needle miners (L)	20	37,560	6,080	2,640	0	46,280
All insects	229	56,110	10,730	7,260	940	75,040
All damage	229	56,110	10,730	7,260	940	75,040

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation				All intensities
		Light	Moderate	Heavy	Very heavy	
	Number			Acres		
Fremont N.F.:						
Fir engraver	8	330	210	0	0	540
Mountain pine beetle (L)	80	21,030	72,360	2,350	13,950	109,690
Mountain pine beetle (P)	51	4,820	210	280	0	5,310
Oregon pine ips	35	940	910	910	0	2,760
Western pine beetle	90	10,870	1,560	0	0	12,430
All insects	264	37,990	75,250	3,540	13,950	130,730
All damage	264	37,990	75,250	3,540	13,950	130,730
Lookout Mt. District:						
Douglas-fir beetle	1	10	0	0	0	10
Fir engraver	1	10	0	0	0	10
All insects	2	20	0	0	0	20
All damage	2	20	0	0	0	20

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Malheur N.F.:						
Fir engraver	12	460	30	0	0	490
Mountain pine beetle (L)	25	1,770	2,740	1,360	0	5,870
Mountain pine beetle (P)	29	1,430	760	510	0	2,700
Oregon pine ips	118	3,650	2,060	1,140	2,930	9,780
Western pine beetle	47	5,500	4,140	0	0	9,640
Spider mite	6	350	0	0	0	350
All insects	237	13,160	9,730	3,010	2,930	28,830
All damage	237	13,160	9,730	3,010	2,930	28,830
Mt. Hood N.F.:						
Douglas-fir beetle	10	320	130	130	0	580
Fir engraver	12	520	60	0	0	580
Mountain pine beetle (W)	65	5,640	1,400	360	110	7,510
Mountain pine beetle (P)	12	1,040	640	0	0	1,680
Oregon pine ips	42	1,080	1,260	290	50	2,680
Western pine beetle	10	1,330	0	0	0	1,330
Balsam woolly aphid	90	22,740	3,380	280	0	26,400
Sawflies on true firs	1	1,200	0	0	0	1,200
Larch sawfly	2	0	200	480	0	680
Sawflies on hemlock	1	500	0	0	0	500
All insects	245	34,370	7,070	1,540	160	43,140
Bear damage	9	620	0	0	0	620
All damage	254	34,990	7,070	1,540	160	43,760

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Northwest Oregon District:						
Douglas-fir beetle	4	220	0	0	0	220
Tent caterpillar on red alder	4	0	7,240	0	0	7,240
All insects	8	220	7,240	0	0	7,460
Bear damage	72	7,630	2,630	0	0	10,260
All damage	80	7,850	9,870	0	0	17,720
Ochoco N.F.:						
Fir engraver	12	620	370	200	520	1,710
Mountain pine beetle (P)	26	1,700	70	320	0	2,090
Oregon pine ips	23	880	310	70	70	1,330
Western pine beetle	56	11,170	720	960	0	12,850
All insects	117	14,370	1,470	1,550	590	17,980
All damage	117	14,370	1,470	1,550	590	17,980

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Rogue River N.F.:						
Douglas-fir beetle	131	6,940	1,820	660	0	9,420
Fir engraver	16	2,130	0	0	0	2,130
Mountain pine beetle (S)	7	520	0	0	0	520
Mountain pine beetle (W)	8	570	150	0	0	720
Mountain pine beetle (P)	9	1,510	0	0	0	1,510
Oregon pine ips	24	1,540	530	0	0	2,070
Western pine beetle	60	5,120	1,590	380	0	7,090
Balsam woolly aphid	21	7,520	1,000	0	0	8,520
All insects	276	25,850	5,090	1,040	0	31,980
All damage	276	25,850	5,090	1,040	0	31,980
Siskiyou N.F.:						
Douglas-fir beetle	170	11,510	3,410	1,240	0	16,160
Fir engraver	4	240	0	0	0	240
Mountain pine beetle (S)	4	180	0	0	0	180
Mountain pine beetle (W)	11	800	0	0	0	800
Mountain pine beetle (P)	1	80	0	0	0	80
Oregon pine ips	3	350	0	0	0	350
Western pine beetle	12	560	340	0	0	900
Balsam woolly aphid	25	2,990	1,670	0	0	4,660
Sawflies	15	320	2,380	1,700	1,620	6,020
All insects	245	17,030	7,800	2,940	1,620	29,390
All damage	245	17,030	7,800	2,940	1,620	29,390

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Siuslaw N.F.:						
Douglas-fir beetle	85	2,620	1,300	680	0	4,600
Douglas-fir engraver	2	200	0	0	0	200
Spider mite	6	0	12,850	0	0	12,850
Tent caterpiller on red alder	4	110	3,641	0	0	3,751
All insects	97	2,930	17,791	680	0	21,401
Bear damage	43	3,170	470	0	0	3,640
All damage	140	6,100	18,261	680	0	25,041
Umatilla I.R.:						
Fir engraver	2	20	0	0	0	20
Mountain pine beetle (P)	2	20	0	100	0	120
Oregon pine ips	6	80	180	0	0	260
All insects	10	120	180	100	0	400
All damage	10	120	180	100	0	400

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Umatilla N.F.:						
Douglas-fir beetle	3	100	0	0	0	100
Engelmann spruce beetle	6	230	70	0	0	300
Fir engraver	102	2,980	2,970	780	640	7,370
Mountain pine beetle (L)	21	700	1,250	960	0	2,910
Mountain pine beetle (P)	25	790	1,410	0	160	2,360
Oregon pine ips	75	1,540	590	20	40	2,190
Western pine beetle	27	1,090	0	160	0	1,250
All insects	259	7,430	6,290	1,920	840	16,480
All damage	259	7,430	6,290	1,920	840	16,480
Umpqua N.F.:						
Douglas-fir beetle	75	4,190	1,650	120	0	5,960
Douglas-fir engraver	1	20	0	0	0	20
Mountain pine beetle (L)	1	70	0	0	0	70
Mountain pine beetle (S)	2	300	0	0	0	300
Mountain pine beetle (W)	83	6,950	1,040	1,290	0	9,280
Mountain pine beetle (P)	1	250	0	0	0	250
Western pine beetle	1	20	0	0	0	20
Balsam woolly aphid	60	13,950	1,330	300	400	15,980
All insects	224	25,750	4,020	1,710	400	31,880
Bear damage	3	1,080	0	0	0	1,080
All damage	227	26,830	4,020	1,710	400	32,960

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Wallowa-Whitman N.F.:						
Douglas-fir beetle	55	1,550	730	0	0	2,280
Engelmann spruce beetle	16	840	1,530	500	0	2,870
Fir engraver	115	5,970	3,930	1,800	60	11,760
Mountain pine beetle (L)	29	2,120	1,330	4,080	2,090	9,620
Mountain pine beetle (P)	76	6,900	8,430	4,950	2,080	22,360
Oregon pine ips	266	9,800	13,730	4,910	2,370	30,810
Western pine beetle	31	2,050	220	0	0	2,270
All insects	588	29,230	29,900	16,240	6,600	81,970
All damage	588	29,230	29,900	16,240	6,600	81,970
Warm Springs I.R.:						
Fir engraver	4	160	0	0	0	160
Mountain pine beetle (L)	1	0	180	0	0	180
Mountain pine beetle (W)	5	210	0	320	0	530
Mountain pine beetle (P)	2	200	0	0	0	200
Oregon pine ips	13	310	440	0	780	1,530
Western pine beetle	16	2,900	1,740	600	0	5,240
Balsam woolly aphid	6	900	60	0	0	960
Sawflies on true firs	1	2,280	0	0	0	2,280
All insects	48	6,960	2,420	920	780	11,080
All damage	48	6,960	2,420	920	1 780	11,080

See footnotes at end of table.

Table 41.--Extent of infestations in Oregon in 1967 ... (Concluded)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Willamette N.F.:						
Douglas-fir beetle	72	2,720	190	160	0	3,070
Mountain pine beetle (L)	8	230	170	0	0	400
Mountain pine beetle (W)	247	38,600	18,810	8,830	4,100	70,340
Oregon pine ips	2	20	0	0	0	20
Balsam woolly aphid	196	38,190	8,770	1,970	720	49,650
All insects	525	79,760	27,940	10,960	4,820	123,480
Bear damage	26	2,180	570	0	0	2,750
All damage	551	81,940	28,510	10,960	4,820	126,230
Winema N.F.:						
Fir engraver	2	210	0	0	0	210
Mountain pine beetle (L)	99	19,430	14,580	6,570	320	40,900
Mountain pine beetle (W)	4	470	190	0	0	660
Mountain pine beetle (P)	19	2,240	80	0	0	2,320
Oregon pine ips	12	470	100	380	0	950
Western pine beetle	30	6,420	0	0	0	6,420
Sawflies on true firs	1	0	210	710	0	920
Needle miners (L)	14	7,060	4,600	7,640	14,880	34,180
Needle miners (P)	5	4,800	0	0	0	4,800
All insects	186	41,100	19,760	15,300	15,200	91,360
All damage	186	41,100	19,760	15,300	15,200	91,360

1/ Mountain pine beetle and needle miner damage has been separated by tree species attacked: L, lodgepole pine; P, ponderosa pine; W, western white pine; K, knobcone pine; S, sugar pine.

2/ Reporting areas are abbreviated as follows: N.F., National Forest; I.R., Indian Reservation; N.P., National Park.

Table 42.--Extent of infestations in Washington in 1967, by reporting area, insect species, and intensity of infestation

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Colville N.F.:						
Douglas-fir beetle	104	3,360	5,340	5,750	1,720	16,170
Engelmann spruce beetle	2	240	0	0	0	240
Fir engraver	1	0	100	0	0	100
Mountain pine beetle (L)	1	0	0	0	640	640
Mountain pine beetle (W)	3	180	400	560	560	1,700
Mountain pine beetle (P)	9	280	470	1,160	180	2,090
Larch sawfly	7	3,400	9,560	220	0	13,180
Larch bud moth	56	80,800	10,560	8,080	2,940	102,380
Larch casebearer	40	109,730	27,420	19,120	37,230	193,500
All insects	223	197,990	53,850	34,890	43,270	330,000
All damage	223	197,990	53,850	34,890	43,270	330,000
Colville I.R.:						
Douglas-fir beetle	66	2,940	2,860	1,620	520	7,940
Fir engraver	1	0	0	160	0	160
Mountain pine beetle (P)	8	340	640	0	0	980
Western pine beetle	2	920	0	0	0	920
Larch bud moth	9	4,880	12,280	4,280	0	21,440
Larch casebearer	13	3,520	3,040	1,600	5,600	13,760
All insects	99	12,600	18,820	7,660	6,120	45,200
All damage	99	12,600	18,820	7,660	6,120	45,200

See footnotes at end of table.

Table 42.--Extent of infestations in Washington in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Gifford Pinchot N.F.:						
Douglas-fir beetle	54	6,100	4,000	3,060	80	13,240
Mountain pine beetle (W)	21	2,480	2,560	120	360	5,520
Western pine beetle	1	480	0	0	0	480
Balsam woolly aphid	49	24,000	1,800	920	0	26,720
All insects	125	33,060	8,360	4,100	440	45,960
Bear damage	33	14,240	7,700	520	280	22,740
Dying hemlock	2	120	50	0	0	170
All damage	160	47,420	16,110	4,620	720	68,870
Glenwood District:						
Douglas-fir beetle	4	580	240	0	0	820
Fir engraver	2	280	0	0	0	280
Mountain pine beetle (P)	6	600	460	0	0	1,060
Western pine beetle	4	1,400	0	0	0	1,400
All insects	16	2,860	700	0	0	3,560
Bear damage	1	220	0	0	0	220
All damage	17	3,080	700	0	0	3,780

See footnotes at end of table.

Table 42.--Extent of infestations in Washington in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Kaniksu N.F.:						
Douglas-fir beetle	3	170	160	0	0	330
Engelmann spruce beetle	3	390	0	0	0	390
Mountain pine beetle (W)	9	1,130	320	0	0	1,450
Larch sawfly	3	360	760	120	0	1,240
Larch casebearer	23	51,800	132,580	90,630	75,550	350,560
All insects	41	53,850	133,820	90,750	75,550	353,970
All damage	41	53,850	133,820	90,750	75,550	353,970
Mt. Baker N.F.:						
Douglas-fir beetle	8	520	1,540	160	0	2,220
Mountain pine beetle (W)	19	1,810	2,680	160	0	4,650
Silver fir beetles	17	2,260	2,390	0	0	4,650
Western hemlock looper	1	0	0	0	1,600	1,600
All insects	45	4,590	6,610	320	1,600	13,120
Dying hemlock	31	12,840	8,560	520	0	21,920
All damage	76	17,430	15,170	840	1,600	35,040

See footnotes at end of table.

Table 42.--Extent of infestations in Washington in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Mt. Rainier N.P.:						
Mountain pine beetle (W)	5	920	0	0	0	920
Balsam woolly aphid	10	1,350	380	480	0	2,210
All insects	15	2,270	380	480	0	3,130
Bear damage	1	0	90	0	0	90
All damage	16	2,270	470	480	0	3,220
Northeast Washington:						
Mountain pine beetle (P)	4	490	0	120	0	610
Oregon pine ips	1	90	0	0	0	90
Larch casebearer	37	87,920	41,710	20,820	32,280	182,730
All insects	42	88,500	41,710	20,820	32,280	183,430
All damage	42	88,500	41,710	20,940	32,280	183,430

See footnotes at end of table

Table 42.--Extent of infestations in Washington in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Okanogan N.F.:						
Douglas-fir beetle	67	4,050	3,770	2,760	920	11,500
Engelmann spruce beetle	15	1,600	1,340	620	200	3,760
Fir engraver	8	360	390	370	0	1,120
Mountain pine beetle (L)	3	0	210	440	0	650
Mountain pine beetle (W)	1	100	0	0	0	100
Mountain pine beetle (P)	62	2,020	5,080	3,190	1,680	11,970
Oregon pine ips	2	370	0	0	0	370
Western pine beetle	4	330	140	0	0	470
Larch sawfly	6	960	280	0	0	1,240
Larch bud moth	11	7,400	6,320	960	560	15,240
All insects	179	17,190	17,530	8,340	3,360	46,420
All damage	179	17,190	17,530	8,340	3,360	46,420
Olympic N.F.:						
Mountain pine beetle (W)	4	440	160	0	0	600
Silver fir beetles	3	640	0	0	0	640
All insects	7	1,080	160	0	0	1,240
Bear damage	50	14,100	4,720	1,400	640	20,860
Dying hemlock	7	12,200	3,900	1,840	0	17,940
All damage	64	27,380	8,780	3,240	640	40,040

See footnotes at end of table.

Table 42.--Extent of infestations in Washington in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Olympic N.P.:						
Douglas-fir beetle	3	100	160	0	0	260
Mountain pine beetle (W)	46	5,260	3,200	820	340	9,620
Silver fir beetles	2	160	120	0	0	280
All insects	51	5,520	3,480	820	340	10,160
Dying hemlock	5	3,440	1,240	0	0	4,680
All damage	56	8,960	4,720	820	340	14,840
Quinault I.R.:						
Mountain pine beetle (W)	10	12,620	920	2,280	480	16,300
All insects	10	12,620	920	2,280	480	16,300
Bear damage	1	200	000	0	0	200
All damage	11	12,820	920	2,280	480	16,500

See footnotes at end of table.

Table 42.--Extent of infestations in Washington in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Snoqualmie N.F.:						
Mountain pine beetle (W)	28	4,720	3,280	440	0	8,440
Silver fir beetles	7	1,160	240	0	0	1,400
Balsam woolly aphid	33	7,320	2,200	520	480	10,520
All insects	68	13,200	5,720	960	480	20,360
Bear damage	9	1,320	1,240	0	0	2,560
All damage	77	14,520	6,960	960	480	22,920
Southwest Washington:						
Douglas-fir beetle	4	240	0	0	0	240
Silver fir beetles	1	80	0	0	0	80
Balsam woolly aphid	4	1,230	560	0	0	1,790
All insects	9	1,550	560	0	0	2,110
Bear damage	34	11,480	4,680	1,380	840	18,380
All damage	43	13,030	5,240	1,380	840	20,490

See footnotes at end of table.

Table 42.--Extent of infestations in Washington in 1967 ... (Continued)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Spokane I.R.:						
Mountain pine beetle (P)	2	80	110	160	0	350
Oregon pine ips	1	130	0	0	0	130
Larch casebearer	8	14,360	5,160	7,580	16,000	43,100
All insects	11	14,570	5,270	7,740	16,000	43,580
All damage	11	14,570	5,270	7,740	16,000	43,580
Umatilla N.F.:						
Douglas-fir beetle	1	50	0	0	0	50
Engelmann spruce beetle	3	90	50	0	0	140
Fir engraver	31	1,200	270	0	0	1,470
Mountain pine beetle (P)	5	100	40	0	0	140
Oregon pine ips	7	80	230	0	0	310
Western pine beetle	1	70	0	0	0	70
All insects	48	1,590	590	0	0	2,180
All damage	48	1,590	590	0	0	2,180

See footnotes at end of table.

Table 42.--Extent of infestations in Washington in 1967 ... (Concluded)

Reporting area and insects involved 1/ 2/	Infestation centers	Intensity of infestation: Light	Moderate	Heavy	Very heavy	All intensities
	Number			Acres		
Wenatchee N.F.:						
Douglas-fir beetle	2	600	40	0	0	640
Engelmann spruce beetle	1	120	0	0	0	120
Fir engraver	2	320	0	0	0	320
Mountain pine beetle (L)	3	800	80	0	0	880
Mountain pine beetle (W)	88	11,520	5,220	4,540	1,760	23,040
Mountain pine beetle (P)	4	120	440	400	0	960
Western pine beetle	3	160	80	0	0	240
All insects	103	13,640	5,860	4,940	1,760	26,200
All damage	103	13,640	5,860	4,940	1,760	26,200
Yakima I.R.:						
Fir engraver	1	130	0	0	0	130
Mountain pine beetle (L)	1	360	0	0	0	360
Mountain pine beetle (W)	6	1,100	330	510	0	1,940
Mountain pine beetle (P)	2	130	0	0	0	130
Western pine beetle	11	1,950	1,200	0	0	3,150
Balsam woolly aphid	1	0	230	0	0	230
All insects	22	3,670	1,760	510	0	5,940
All damage	22	3,670	1,760	510	0	5,940

1/ Mountain pine beetle damage has been separated by tree species attacked: L, lodgepole pine; P, ponderosa pine; W, western white pine.

2/ Reporting areas are abbreviated as follows: N.F., National Forest; I.R., Indian Reservation; N.P., National Park.

GPO 993-870

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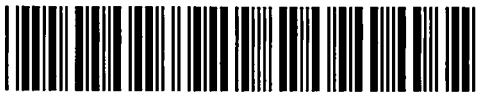
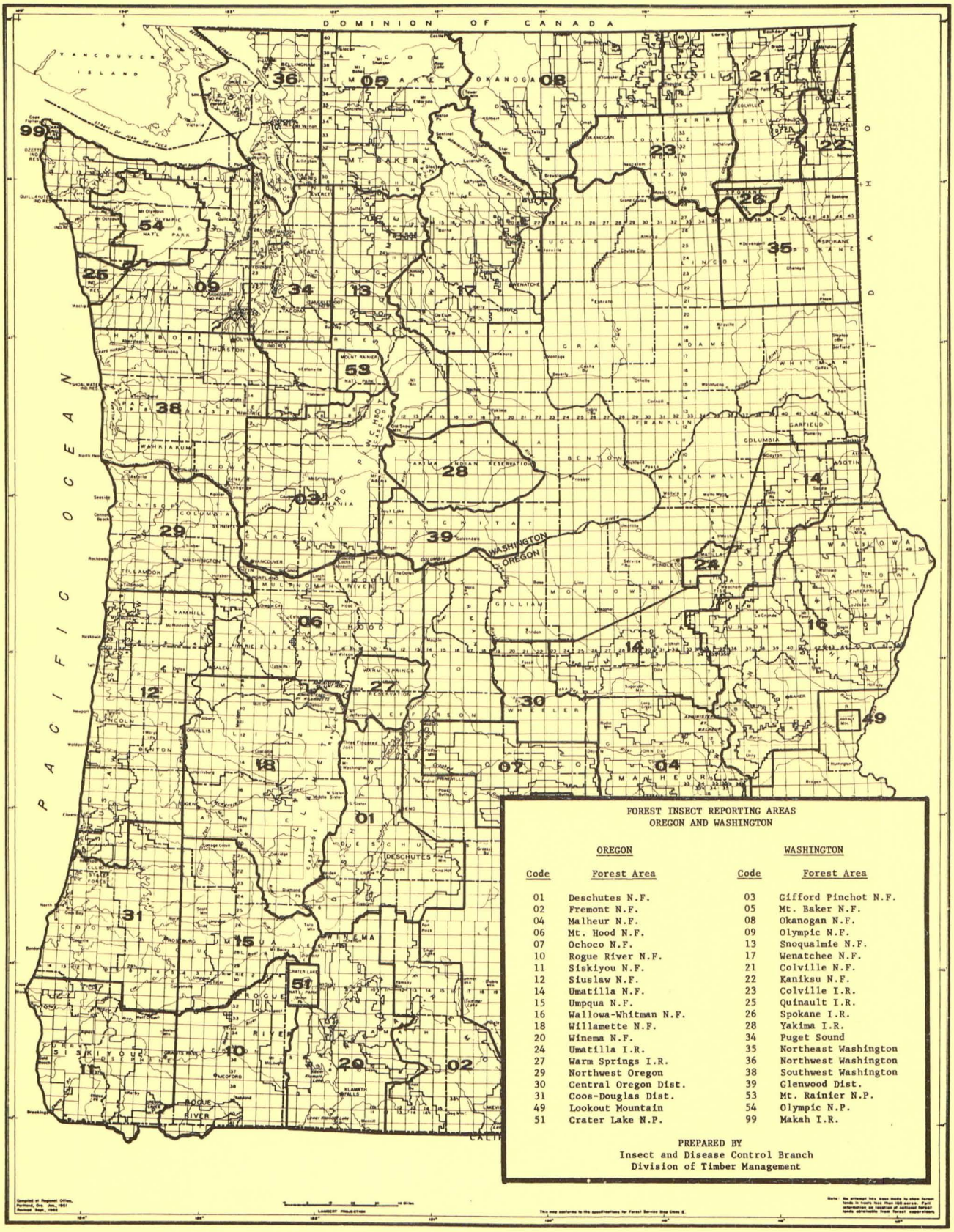


266



FOREST INSECT REPORTING AREAS
OREGON AND WASHINGTON

OREGON		WASHINGTON	
Code	Forest Area	Code	Forest Area
01	Deschutes N.F.	03	Gifford Pinchot N.F.
02	Fremont N.F.	05	Mt. Baker N.F.
04	Malheur N.F.	08	Okanogan N.F.
06	Mt. Hood N.F.	09	Olympic N.F.
07	Ochoco N.F.	13	Snoqualmie N.F.
10	Rogue River N.F.	17	Wenatchee N.F.
11	Siskiyou N.F.	21	Colville N.F.
12	Siuslaw N.F.	22	Kaniksu N.F.
14	Umatilla N.F.	23	Colville I.R.
15	Umpqua N.F.	25	Quinault I.R.
16	Wallowa-Whitman N.F.	26	Spokane I.R.
18	Willamette N.F.	28	Yakima I.R.
20	Winema N.F.	34	Puget Sound
24	Umatilla I.R.	35	Northeast Washington
27	Warm Springs I.R.	36	Northwest Washington
29	Northwest Oregon	38	Southwest Washington
30	Central Oregon Dist.	39	Glenwood Dist.
31	Coos-Douglas Dist.	53	Mt. Rainier N.P.
49	Lookout Mountain	54	Olympic N.P.
51	Crater Lake N.P.	99	Makah I.R.

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Insect and Disease Control Branch
Division of Timber Management